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NOTICE OF ALLOWANCE AND FEE(S) DUE

7590

11/18/2009

ANDREW M. CALDERON GREENBLUM AND BERNSTEIN, P.L.C. 1950 ROLAND CLARKE PLACE RESTON, VA 20191 EXAMINER

MIRZA, ADNAN M

ART UNIT PAPER NUMBER

2445

DATE MAILED: 11/18/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,538	01/16/2004	Gordan G. Greenlee	END920030141US1	5583

TITLE OF INVENTION: VIRTUAL CLUSTERING AND LOAD BALANCING SERVERS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	02/18/2010

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THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

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						(Signature)
						(Date)
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MIRZA, A		2445	709-226000 2. For printing on the p.	atant front and list		
 Change of correspondence address or indication of "Fee Address" (37 CFR 1.363). □ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached. □ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required. 			or agents OR, alternativ (2) the name of a single registered attorney or a	ame of a single firm (having as a member a d attorney or agent) and the names of up to red patent attorneys or agents. If no name is		
PLEASE NOTE: Unl	less an assignee is ident th in 37 CFR 3.11. Comp	ified below, no assignee	THE PATENT (print or type data will appear on the pa T a substitute for filing an (B) RESIDENCE: (CITY	ntent. If an assignee assignment.		ocument has been filed for
Please check the appropr	riate assignee category or	categories (will not be pr	rinted on the patent): \Box	Individual	oration or other private gro	oup entity Government
`	are submitted: No small entity discount p # of Copies	permitted)	b. Payment of Fee(s): (Plea A check is enclosed. Payment by credit can The Director is hereby overpayment, to Depo	d. Form PTO-2038 is	attached. the required fee(s), any de	,
5. Change in Entity Sta	itus (from status indicate as SMALL ENTITY statu		b. Applicant is no long	ger claiming SMALL	ENTITY status. See 37 C	FR 1.27(g)(2).
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This collection of inform an application. Confiden submitting the complete this form and/or suggest Box 1450, Alexandria, V Alexandria, Virginia 223	nation is required by 37 C tiality is governed by 35 d application form to the ions for reducing this bu //irginia 22313-1450. DC 813-1450.	OFR 1.311. The informatic U.S.C. 122 and 37 CFR USPTO. Time will vary den, should be sent to the ONOT SEND FEES OR	on is required to obtain or r 1.14. This collection is est depending upon the indiv e Chief Information Office COMPLETED FORMS TO	etain a benefit by the imated to take 12 min idual case. Any comr r, U.S. Patent and Tra DTHIS ADDRESS. S	public which is to file (an- utes to complete, includin nents on the amount of ti demark Office, U.S. Dep END TO: Commissioner	d by the USPTO to process) ag gathering, preparing, and me you require to complete artment of Commerce, P.O. for Patents, P.O. Box 1450,

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ANDREW M. CALDERON			MIRZA, A	DNAN M
Greek (Greek (Gr			PAPER NUMBER	
1950 ROLAND CI RESTON, VA 201			2445 DATE MAILED: 11/18/200	0

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 1094 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 1094 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

	Application No.	Applicant(s)
	10/758,538	GREENLEE ET AL.
Notice of Allowability	Examiner	Art Unit
	ADNAN MIRZA	2445
The MAILING DATE of this communication appearable communication appearable claims being allowable, PROSECUTION ON THE MERITS IS herewith (or previously mailed), a Notice of Allowance (PTOL-85) NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIPLY of the Office or upon petition by the applicant. See 37 CFR 1.313	(OR REMAINS) CLOSED or other appropriate comr IGHTS. This application is	in this application. If not included nunication will be mailed in due course. THIS
1. This communication is responsive to <u>08/03/2009</u> .		
2. X The allowed claim(s) is/are 1,4-18,21-24 and 27-45.		
 Acknowledgment is made of a claim for foreign priority ur a) All b) Some* c) None of the: 1. Certified copies of the priority documents have 2. Certified copies of the priority documents have 3. Copies of the certified copies of the priority documents have International Bureau (PCT Rule 17.2(a)). 	been received. been received in Applicate	ion No
* Certified copies not received:		
Applicant has THREE MONTHS FROM THE "MAILING DATE" noted below. Failure to timely comply will result in ABANDONN THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.		le a reply complying with the requirements
4. A SUBSTITUTE OATH OR DECLARATION must be subm INFORMAL PATENT APPLICATION (PTO-152) which give		
5. CORRECTED DRAWINGS (as "replacement sheets") mus	st be submitted.	
(a) I including changes required by the Notice of Draftspers	on's Patent Drawing Revi	ew (PTO-948) attached
1) 🔲 hereto or 2) 🔲 to Paper No./Mail Date		
(b) ☐ including changes required by the attached Examiner's Paper No./Mail Date		
Identifying indicia such as the application number (see 37 CFR 1 each sheet. Replacement sheet(s) should be labeled as such in t		
6. DEPOSIT OF and/or INFORMATION about the depo attached Examiner's comment regarding REQUIREMENT		
Attachment(s) 1. ☐ Notice of References Cited (PTO-892) 2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948) 3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material	6. ☐ Interview Paper No 7. ☑ Examiner	Informal Patent Application Summary (PTO-413), b./Mail Date s Amendment/Comment s Statement of Reasons for Allowance
	/VIVEK SRIV	'ASTAVA/ atent Examiner, Art Unit 2445

25	the plurality of servers;	Deleted: and
24	creating a new virtual cluster comprising only the removed at least one of	,
23	when at least one of the plurality of servers is burdened;	
22	removing at least one of the plurality of servers from the virtual cluster	
21	based on predetermined criteria in order to allocate system resources;	
20	routing a predatity of virtual cluster of the plurality of virtual clusters	
19	defining a plurality of virtual clusters from a plurality of servers;	
18	comprising the steps of:	
16 17	1. (Currently Amended) A method of processing queries in a network,	
15		
14	<u>Listing of Claims</u>	
13		
12	Please amend claims 1, 18, 24 and cancel claims 2,3,19,20,25,26.	
	Diagon amond plaims 1, 10, 24 and agreed plaims 2, 2, 10, 00, 05, 00	
11		
10	interview with Andrew Wright on 11/03/2009.	
9	Authorization for this Examiner's Amendment was given in a telephone	
8		
7	issue fee.	
6	such an amendment, it must be submitted no later than the payment of the	
5	may be filed as provided by 37 CFR 1.312. To ensure consideration of	
4	changes and/or additions be unacceptable to applicants, an amendment	
3	An Examiner's Amendment to the record appears below. Should the	
2		
_		

26	returning the removed at least one of the plurality of servers back to the
27	virtual cluster when the at least one of the plurality of servers is unburdened;
28	monitoring performance of the plurality of servers; and
29	sending a report in response to workload at one of the plurality of servers
30	exceeding a pre-determined threshold so that routing of further requests to the one
31	of the plurality of servers is altered; and
32	removing the one of the plurality of servers from an associated virtual
33	cluster and adding the one of the plurality of servers back into the associated
34	virtual cluster in response to workload falling below the predetermined threshold.
35	
36	2. (Canceled)
37	
38	3. (Canceled)
39	
40	4. (Currently Amended) The method of claim, 1, wherein the sending a
70	() () () () () () () () () ()
41	report sends a report to a network dispatcher and the network dispatcher performs
41	report sends a report to a network dispatcher and the network dispatcher performs
41 42	report sends a report to a network dispatcher and the network dispatcher performs
41 42 43	report sends a report to a network dispatcher and the network dispatcher performs the routing.
41 42 43 44	report sends a report to a network dispatcher and the network dispatcher performs the routing. 5. (Original) The method of claim 1, further comprising the steps of:
41 42 43 44 45	report sends a report to a network dispatcher and the network dispatcher performs the routing. 5. (Original) The method of claim 1, further comprising the steps of: determining that one of the plurality of servers is overburdened based on
41 42 43 44 45 46	report sends a report to a network dispatcher and the network dispatcher performs the routing. 5. (Original) The method of claim 1, further comprising the steps of: determining that one of the plurality of servers is overburdened based on statistics; and
41 42 43 44 45 46 47	report sends a report to a network dispatcher and the network dispatcher performs the routing. 5. (Original) The method of claim 1, further comprising the steps of: determining that one of the plurality of servers is overburdened based on statistics; and reducing workload to the one of the plurality of servers if the statistics are
41 42 43 44 45 46 47 48	report sends a report to a network dispatcher and the network dispatcher performs the routing. 5. (Original) The method of claim 1, further comprising the steps of: determining that one of the plurality of servers is overburdened based on statistics; and reducing workload to the one of the plurality of servers if the statistics are
41 42 43 44 45 46 47 48 49	report sends a report to a network dispatcher and the network dispatcher performs the routing. 5. (Original) The method of claim 1, further comprising the steps of: determining that one of the plurality of servers is overburdened based on statistics; and reducing workload to the one of the plurality of servers if the statistics are above a threshold.
41 42 43 44 45 46 47 48 49 50	report sends a report to a network dispatcher and the network dispatcher performs the routing. 5. (Original) The method of claim 1, further comprising the steps of: determining that one of the plurality of servers is overburdened based on statistics; and reducing workload to the one of the plurality of servers if the statistics are above a threshold. 6. (Original) The method of claim 5, wherein the reducing step includes at
41 42 43 44 45 46 47 48 49 50 51	report sends a report to a network dispatcher and the network dispatcher performs the routing. 5. (Original) The method of claim 1, further comprising the steps of: determining that one of the plurality of servers is overburdened based on statistics; and reducing workload to the one of the plurality of servers if the statistics are above a threshold. 6. (Original) The method of claim 5, wherein the reducing step includes at least one of removing the one of a plurality of servers from one of the plurality of

55	7. (Original) The method of claim 6, wherein the reducing step includes
56	reassigning the one of a plurality of servers to another one of the plurality of
57	virtual clusters.
58	
59	8. (Original) The method of claim 1, wherein at least one of the plurality
60	of servers is assigned to more than one of the plurality of virtual clusters.
61	
62	9. (Original) The method of claim 1, wherein the predetermined criteria
63	includes at least one of requester identity, requested application, time of day, day
64	of week, and performance statistics.
65	
66	10. (Original) The method of claim 9, wherein the requester identity is an
67	internet address.
68	
69	11. (Original) The method of claim 9, wherein the performance statistics
70	include at least one of central processing unit (CPU) performance statistics,
71	memory statistics, connection counts, throughput statistics, and response time
72	statistics.
73	
74	12. (Original) The method of claim 1, wherein the routing step includes
75	selecting one of the plurality of virtual clusters for routing based on at least one of
76	a requester's identity and a requested application.
77	
78	13. (Original) The method of claim 12, further including selecting one
79	server from the one of the plurality of virtual clusters for routing based on
80	statistics.
81	
82	14. (Original) The method of claim 13, wherein the selecting is based on
83	performance statistics.
84	

85	15. (Original) The method of claim 1, wherein at least one of the plurality
86	of servers is at least one of a lightweight directory access protocol (LDAP) server
87	and a web application server.
88	
89	16. (Original) The method of claim 1, wherein the routing uses rules based
90	routing.
91	
92	17. (Original) The method of claim 1, further comprising the steps of
93	reassigning one of the plurality of servers from one of the plurality of virtual
94	clusters to another one of the plurality of virtual clusters, wherein the one of the
95	plurality of virtual clusters has a workload below a threshold and the another one
96	of the plurality of virtual clusters has a workload above the predetermined
97	threshold.
98	
99	18. (Currently Amended) A method for load balancing servers, comprising
100	the steps of:
101	allocating a plurality of servers among a plurality of virtual clusters;
102	monitoring the plurality of virtual clusters for workload capacity;
103	removing at least one of the plurality of servers from the plurality of
104	virtual clusters when at least one of the plurality of servers is burdened;
105	creating a new virtual cluster comprising only the removed at least one of
106	the plurality of servers;
107	returning the removed at least one of the plurality of servers back to the
108	plurality of virtual clusters when the at least one of the plurality of servers is
109	unburdened; and
110	reassigning at least one server from one of the plurality of virtual clusters
111	to another of the plurality of virtual clusters based on workload capacity of the at
112	least one server in order to reallocate system resources,
113	wherein the monitoring step includes determining when a workload
114	capacity of the one of the plurality of virtual clusters has crossed a threshold

115	based on statistics associated with the one of a plurality of virtual cluster's
116	performance; and
117	further comprising the step of identifying another of the plurality of virtual
118	cluster having available workload capacity based on statistics associated with the
119	virtual cluster's performance and transferring at least one of the plurality of
120	servers to the another of the virtual cluster.
121	
122	19. (Canceled)
123	
124	20. (Canceled)
125	
126	21. (Original) The method of claim 18, wherein the reassigning at least
127	one server includes one of:
128	removing the server entirely from the one of a plurality of virtual cluster,
129	and
130	assigning the at least one server to both the one of a plurality of virtual
131	clusters and the another of the plurality of virtual clusters.
132	
133	22. (Original) The method of claim 18, further comprising routing a
134	request to one of the plurality of virtual clusters based on one of the requestor's
135	identity, the requested application, and rules.
136	
137	23. (Original) The method of claim 22, further comprising selecting one
138	server assigned to the one of the plurality of virtual clusters based on statistics for
139	routing the request.
140	
141	24. (Currently Amended) A computer program product comprising a
142	computer usable storage medium having readable program code embodied in the
143	storage medium, the computer program product includes at least one component
144	to:

145	define a plurality of virtual clusters from a plurality of servers;	
146	route a request to a virtual cluster of the plurality of virtual clusters based	
147	on predetermined criteria to allocate system resources;	
148	remove at least one of the plurality of servers from the virtual cluster when	
149	at least one of the plurality of servers is burdened;	
150	create a new virtual cluster comprising only the removed at least one of	
151	the plurality of servers;	
152	return the removed at least one of the plurality of servers back to the	
153	virtual cluster when the at least one of the plurality of servers is unburdened;	
154	monitor performance of the plurality of servers:	
155	send a report in response to workload at one of the plurality of servers	
156	exceeding a pre-determined threshold so that routing of further requests to the one	
157	of the plurality of servers is altered; and	
158	remove the one of the plurality of servers from an associated virtual	
159	cluster and add the one of the plurality of servers back into the associated virtual	
160	cluster in response to workload falling below the predetermined threshold.	
161		
162	25. (Canceled)	
163		
164	26. (Canceled)	
165		
166	27. (Original) The system of claim 24, wherein the at least one component	
167	sends a report to a network dispatcher and the network dispatcher performs the	
168	routing.	
169		
170	28. (Original) The system of claim 24, wherein the at least one	
171	component:	
172	determines that one of the plurality of servers is overburdened based on	
173	statistics; and	

174	reduces workload to the one of a plurality of servers if the statistics are
175	above a threshold.
176	
177	29. (Original) The system of claim 28, wherein the at least one component
178	removes the one of a plurality of servers from one of the plurality of virtual
179	clusters and limits further requests from being routed to the one of a plurality of
180	servers.
181	
182	30. (Original) The system of claim 29, wherein the at least one component
183	reassigns the one of a plurality of servers to another one of the plurality of virtual
184	clusters to reallocate the system resources.
185	
186	31. (Original) The system of claim 24, wherein the at least one component
187	assigns at least one of the plurality of servers to more than one of the plurality of
188	virtual clusters.
189	
190	32. (Original) The system of claim 24, wherein the predetermined criteria
191	includes at least one of requester identity, requested application, time of day, day
192	of week, performance statistics.
193	
194	33. (Original) The system of claim 32, wherein the requester identity is a
195	network address.
196	
197	34. (Original) The system of claim 32, wherein the performance statistics
198	include at least one of central processing unit (CPU) performance statistics,
199	memory statistics, connection counts, throughput statistics, and response time
200	statistics.
201	

202	35. (Original) The system of claim 24, wherein the at least one component
203	selects one of the plurality of virtual clusters for routing based on at least one of a
204	requester's identity, composite statistics, and a requested application.
205	
206	36. (Original) The system of claim 24, wherein the at least one component
207	selects a non over-burdened server from the one of the plurality of virtual clusters
208	to process information.
209	
210	37. (Original) The system of claim 36, wherein the at least one component
211	selects based on performance statistics.
212	
213	38. (Original) The system of claim 24, wherein at least one of the plurality
214	of servers is one of a lightweight directory access protocol (LDAP) server and a
215	web application server.
216	
217	39. (Original) The system of claim 24, wherein the at least one component
218	uses rules based routing.
219	
220	40. (Original) The system of claim 24, wherein the at least one component
221	reassigns one of the plurality of servers from one of the plurality of virtual
222	clusters to another one of the plurality of virtual clusters, wherein the another of
223	the plurality of virtual clusters has a workload below a threshold and the one of
224	the plurality of virtual clusters has a workload above the predetermined threshold.
225	
226	41. (Previously Presented) The method of claim 1, further comprising
227	projecting a rate of routing to each of the plurality of servers.
228	
229	42. (Previously Presented) The method of claim 41, further comprising
230	adjusting the rate of routing based on a relative degree of overload on at least one
231	of the plurality of servers.

232	
233	43. (Previously Presented) The method of claim 42, further comprising
234	providing early advisories when the rate of routing is projected to overload at
235	least one of the plurality of servers.
236	
237	44. (Previously Presented) The method of claim 1, further comprising
238	determining when the plurality of servers in the virtual cluster are equivalently
239	loaded over a predetermined workload threshold and more capacity is needed.
240	
241	45. (Previously Presented) The method of claim 1, further comprising re-
242	assigning at least one of the plurality of servers when the virtual cluster is above a
243	predetermined cluster capacity rating.
244	
245	Reasons for Allowance
246	
247	1. Claims 1, 4-18, 21-24 and 27-45 will be allowed.
248	
240	
249	2. The following is an examiner's statement of reasons for allowance.
250	The prior art references most closely resembling the applicants
251	claimed invention is Watt (U.S. 7,213,065) and Bruckert (U.S. Pub.No.
252	2002/0049859).
253	
254	First, Watt disclosed a management tool that streamlines the server
255	allocation and provisioning processes within a data center is provided. The
256	system, method, and computer product divide the server provisioning and
257	allocation into two separate tasks. However Watt failed to disclose,
258	"monitor performance of the plurality of servers;
I	

259	send a report in response to workload at one of the plurality of servers
260	exceeding a pre-determined threshold so that routing of further requests to the one
261	of the plurality of servers is altered; and
262	remove the one of the plurality of servers from an associated virtual
263	cluster and add the one of the plurality of servers back into the associated virtual
264	cluster in response to workload falling below the predetermined threshold.".
265	These limitations are incorporated into all of the independent claims
266	(claims 1, 18, 24).
267	
268	Second Bruckert disclosed a scalable clustered system includes a
269	global fabric, and two or more cluster nodes interconnected via the global
270	fabric and two or more cluster nodes interconnected via the global fabric.
271	Each cluster node includes a node naming agent (NNA), a local fabric and
272	one or more end nodes interconnected via the local fabric. However
273	Bruckert failed to disclose "monitor performance of the plurality of servers;
274	send a report in response to workload at one of the plurality of servers
275	exceeding a pre-determined threshold so that routing of further requests to the one
276	of the plurality of servers is altered; and
277	remove the one of the plurality of servers from an associated virtual cluster and
278	add the one of the plurality of servers back into the associated virtual cluster in
279	response to workload falling below the predetermined threshold". These
280	limitations are incorporated into all of the independent claims (claims 1,
281	18, 24).

In summary, the Examiner submits that Watt and Bruckert taught all the limitations of independent claims in combination with other elements. Specifically prior art does not teach "monitor performance of the plurality of servers;

send a report in response to workload at one of the plurality of servers exceeding a predetermined threshold so that routing of further requests to the one of the plurality of servers is altered; and remove the one of the plurality of servers from an associated virtual cluster and add the one of the plurality of servers back into the associated virtual cluster in response to workload falling below the predetermined threshold; therefore, claims 1, 4-18, 21-24 and 27-45 have been deemed allowable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adnan Mirza whose telephone number is (571) 272-3885. The examiner can normally be reached on Monday through Friday from 9:30 A.M. to 6:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Vivek Srivastava can be reached on (571)-272-7304. The fax phone numbers for the organization where this application or proceeding is assigned are listed herein below.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703)746-7239. Customer service number is (866) 217-9197.

/VIVEK SRIVASTAVA/

Supervisory Patent Examiner, Art Unit 2445